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## TITLE OF THE INVENTION

IMAGE PROCESSING SERVICE SYSTEM

## BACKGROUND OF THE INVENTION

The present invention relates to an image  
5 processing apparatus with image input and output such  
as a copying machine or composite machine. More  
particularly, the present invention relates to an image  
processing service system that executes a variety of  
image processing services via a network.

10 As is well known, unlike a conventional analog  
copying machine, a digital copying machine that is  
primarily available at present handles image data as  
digital information in its internal processing.

This digital copying machine can achieve a basic  
15 copying function, a scanning function that can acquire  
paper information as a digital image, and a printing  
function that can output the digital image on paper.

Further, adding a network connection function to  
the digital copying machine enables functional  
20 expansion via a network such as a facsimile function  
that transmits/receives image data and a network  
printing function.

Such a digital copying machine comprising a  
variety of extended functions in addition to its basic  
25 copying function is called a composite machine or an  
MFP (Multi-Function Peripheral).

A composite machine of such a type integrates a

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plurality of functions in a complete set, thereby  
improving user convenience and achieving advantageous  
effects such as reduction of installation cost or  
reduction of management burden by reduction of  
5 installation space or intensive management/integration  
of functions.

However, there occurs a problem caused by multi-  
functioning. That is, there occurs an occurrence of  
composite problems or a requirement for high level  
10 maintenance work because of higher price caused by  
heavier functioning (lower cost competency), or  
complicated functions.

In addition, because multi-functions are  
intensively managed, there applies a restriction that,  
15 even when these multi-functions are merely  
updated/improved, the entire composite machine must be  
replaced. This means that the user must have a heavy  
burden.

In the meantime, in general, image information  
20 handled by a copying machine/composite machine of such  
a type is higher in quality and resolution than images  
handled by an ordinary Web site, and the amount of data  
is considerably large.

On the other hand, with recent technological  
25 innovation, higher speed communication network  
environments or larger capacity is in progress rapidly.  
Thus, it is expected to develop a communication

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infrastructure such that a large amount of data can be transmitted/received in a copying machine/composite machine in real time.

In addition, with fulfillment of such  
5 communication networks, a business approach to provide services via the Internet, which is called ASP (Application Service Provider), is more popular.

Although functions required for individual devices or terminals have been packaged conventionally, the ASP  
10 approach makes it available to provide required functions as services via a network whenever necessary.

Further, in the Internet environment, data sharing in conformance with a P2P (Peer to Peer) scheme is actively carried out such that any terminal connected  
15 to a network can have server and client functions.

Publicly known examples concerning network connection of a copying machine include those disclosed in Jpn. Pat. Appln. KOKAI Publication Nos. 11-196247 and 2001-86347, and the like.

20 The former discloses a technique for transmitting/receiving image information via a network. The latter discloses a technique for reducing a network burden by compressing image information. However, neither of these publications fails to solve the  
25 problem caused by multi-functioning of the above described composite machine.

## BRIEF SUMMARY OF THE INVENTION

The present invention has been made in view of the above described circumstances. It is an object of the present invention to provide an image processing  
5 service system so as to solve a variety of problems caused by multi-functioning of an image processing apparatus.

An image processing service system according to one embodiment of the present invention provides  
10 predetermined image processing services to an image processing apparatus having an image information input/output function via a network.

## BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING

FIG. 1 is a diagram for explaining a general  
15 configuration of an image processing service system according to one embodiment of the present invention;

FIG. 2 is a block diagram for explaining a detailed configuration of an image processing apparatus in the present embodiment;

20 FIG. 3 is a view for explaining a communication method when service registration is carried out for a service information database of the image processing apparatus in the present embodiment;

FIG. 4 is a view for explaining a mode of  
25 information stored in the service information database of the image processing apparatus in the present embodiment;

FIG. 5 is a view for explaining an example of displaying an advertisement by using an advertisement service which is one of the image processing services in the present embodiment;

FIG. 6A to FIG. 6C are views for explaining an example of an operation UI of the image processing apparatus in the present embodiment, respectively;

FIG. 7 is a view for explaining a table that  
generates a screen displayed by the operation UI in the  
present embodiment;

FIG. 8 is a view for explaining a communication scheme during service utilization between the image processing apparatus and a server in the present embodiment;

15           FIG. 9A and FIG. 9B are views for explaining an  
example of displaying a service menu and a service  
deletion screen in the present embodiment,  
respectively;

FIG. 10A to FIG. 10D are views for explaining an  
example of displaying a screen during service  
20 registration in the present embodiment, respectively;  
and

FIG. 11A and FIG. 11B are views for explaining an  
example of displaying a screen during service  
25 configuration in the present embodiment, respectively.

## DETAILED DESCRIPTION OF THE INVENTION

Hereinafter, one embodiment of the present

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invention will be described in detail with reference to the accompanying drawings. FIG. 1 shows a general configuration of an image processing service system described in the present embodiment.

5           In this image processing service system, image processing apparatuses 11 and 12 and service providers 13 and 14 each having a dedicated server that provides image processing services are connected to be communicable with each other via a network 15.

10           Here, the image processing apparatuses 11 and 12 basically comprise image input functions 11a and 12a and image output functions 11b and 12b. These apparatuses can comprise image processing service functions 11c and 12c.

15           For example, the image processing apparatus 11 carries out image processing for an image input by the image input function 11a by using its own image processing service function 11c, thereby making it possible to output an image via the image output  
20           function 11b.

          In addition, the image processing apparatus 11 provides access to the service providers 13 and 14 via the network 15, and utilizes its own image processing services, thereby making it possible to apply  
25           processing to the input image, and then, output the processed image.

          Further, the image processing apparatus 11

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provides access to another image processing apparatus  
12 via the network 15, and utilizes its own image  
processing service function 12c, thereby making it  
possible to apply processing to the input image, and  
5 then, output the processed image.

FIG. 2 shows a module configuration of the image  
processing apparatus 11. Because, the module  
configuration of another image processing apparatus 12  
is similar to that of the image processing apparatus  
10 11, a description thereof is omitted here.

That is, this image processing apparatus 11  
comprises: an image input section 16 and an image  
output section 17 that are basic functions; an  
input/output control section 18; an image quality  
15 maintenance control section 19; a communication section  
20; an operation display section 21; an operation  
information control section 22; a compression/  
decompression control section 23; an encryption control  
section 24; and a service information database 25.

20 The image processing apparatus 11 can provide  
access to the network 15 via the communication section  
20. In addition, this image processing apparatus 11  
registers its own services in advance in the service  
information database 25 relevant to its required image  
25 processing services.

FIG. 3 shows a communication method when service  
registration is carried out for the service information

database 25. First, when new service registration is carried out by operation UI of a terminal (image processing apparatus 11), it is possible to select whether a service is registered in the terminal or is temporarily utilized without registration.

Depending on whether this service is registered or not, the service provider can discriminate the service charge. As to whether or not the service can be temporarily utilized, it is determined by referring to table A managed by the service provider.

When a service query as to whether the service is registered or is temporarily utilized terminates, adjustment of a compression/decompression scheme of communication data concerning service utilization is then carried out. In adjustment of this compression/decompression scheme, as shown in table B managed by the service provider, the terminal ID assigned to each terminal is utilized, thereby making it possible to set different parameters for each terminal.

Next, adjustment of an encryption/decryption scheme concerning service utilization is carried out. In the adjustment of the encryption/decryption scheme as well, as shown in table B described above, the terminal ID is utilized, whereby different parameters can be set for each terminal, thereby making it possible to improve security. Lastly, information on operation UI required to utilize services at a terminal



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is acquired.

Then, a variety of communication information such as service registration/temporary utilization, compression/decompression scheme, encryption/decryption  
5 scheme, and information on operation UI is stored in the service information database 25 at the terminal.

FIG. 4 shows a mode of information stored in this service information database 25. The UI information expressed by XML or the like is contained in the field  
10 of this UI information. An arbitrary parameter is applied to the field of the encryption scheme or compression scheme.

Here, as shown in FIG. 2, to the network 15, there are reconnected: a service provider 26 that provides  
15 general image processing services; and providers 27, 28, 29, and 30 that provide a accounting service, an advertisement service, a content service, a maintenance service, and the like.

The accounting service acquires information on  
20 what service is utilized or how many times such service is utilized (service utilization history), and executes a process for asking or collecting a service charge for the apparatus 11. The presence of this service makes it possible to actively expand even a small scale  
25 service which does not have a charge collection function.

The advertisement service is a service that

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refunds an advertisement charge to a user every time the image is displayed or printed by embedding an image with advertisements. This service can reduce image processing costs.

5           FIG. 5 shows an example of displaying an advertisement by using this advertisement service. The advertisement display service embeds links relevant to advertisement information instead of merely embedding advertisement information in image information. By  
10 this advertisement information link section, advertisement information is acquired through a link every time the advertisement is displayed or printed, and the acquired advertisement information is filled in the image information. In an example shown in FIG. 5,  
15 when the displaying and printing times are different from each other, real time advertisement information can be presented at their respective different times.

The content service is a service that adds a value added content image to image information to be  
20 displayed or printed, thereby collecting a charge. The content images include a decorative frame, a rule, a character logo or the like, for example.

The maintenance service is a service that diagnoses image information transmitted by the image  
25 quality maintenance control section 19 incorporated in the image processing apparatus 11, detects a failure with the image processing apparatus 11, monitors a use

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state of the apparatus 11, and advises replacement of consumables.

FIG. 6A to FIG. 6C each show an example of the operation UI of the image processing apparatus 11.

5 FIG. 6A presents a list of available image processing services. This list is generated from the service information database 25, as shown in FIG. 2 and FIG. 4.

When a scanning service is selected from this list, for example, a list screen as shown in FIG. 6B is  
10 displayed. On this list screen, basic setting items each configuring the scanning service are displayed. FIG. 6B shows a state when PDF is selected as the scanning file format, monochrome is selected as the color/monochrome setting, and 2in1 is selected as the  
15 disposition setting.

Next, a list screen shown in FIG. 6C is displayed. Here, option settings can be provided to an image to be processed. In FIG. 6C, it is possible to select  
20 whether or not to display an advertisement, to select whether or not to display a specified logo image, and to select an insert location.

The UI information as shown in FIG. 6A to FIG. 6C is stored in a table shown in FIG. 4. As is evident from flow of operation, one "scanning" service can be  
25 categorized into detailed services such as "PDF setting", "monochrome setting", "2in1 setting", "addition of advertisement", and "addition of logo".

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These individual services may be dispersed over the network 15 or may be packaged inside of the image processing apparatus 11, as shown in FIG. 1. In this manner, a plurality of detailed services are combined with each other, whereby a series of image processing service systems can be constructed.

Information concerning a variety of services displayed by basic setting and advanced setting shown in FIG. 6B and FIG. 6C is managed in a table as shown in FIG. 7. "Type" denotes service type.

Version information on services registered for utilization is stored in the version ID. An asterisk \* denotes automatically utilizing the latest version. If a version number and/or level is written, it denotes use of a function of the specified version.

FIG. 8 shows a communication scheme during service utilization. As shown in FIG. 7, the service address is assigned to each service. First, a service query is carried out for such an address. When the service provider has successfully checked the fact that the terminal ID of a request source is correctly registered, a version check is then carried out. Then, the version information shown in FIG. 7 is referred to.

Next, an interface check is carried out. That is, in each service, such an interface portion may be added/changed by version upgrading or the like. By making an interface change the result of version

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upgrading, an interface check is carried out every  
service utilization so as not to rewrite the  
registration information at each terminal. Lastly,  
processing target data is transmitted, and the image  
5 processing result is returned.

FIG. 9A shows an example of displaying a service  
menu. There are three types of service menus: service  
registration, service deletion, and service  
configuration. First, when a service deletion is  
10 selected, as shown in FIG. 9B, the currently registered  
services are displayed. Then, a desired service is  
selected from among these registered services, whereby  
the selected services can be deleted.

When a service registration is selected, as shown  
15 in FIG. 10A, three types of menus containing a service  
list, a service address specification, and a service  
retrieval are displayed. When the service list is  
selected, as shown in FIG. 10B, the contents or prices  
of services are listed.

20 In addition, when the service address  
specification is selected, as shown in FIG. 10C, a  
screen for inputting the service address is displayed.  
Further, when the service retrieval is selected, as  
shown in FIG. 10D, a variety of services such as  
25 service retrieval by type specification, a basic  
process, a transmission/receiving process, and content  
provision are displayed to be selectable.

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Lastly, when the service configuration is selected, as shown in FIG. 11A, service types are listed. For example, a scan is selected, as shown in FIG. 11B, basic services associated with such scan, i.e., a basic setting option and an advanced setting option can be selected.

With a configuration as shown in the above embodiment, first, functions owned by the image processing apparatus are separated so that the apparatus has only the minimum image input/output function. In this manner, image processing functions other than such an image input/output function are provided as image processing services connected via a network in a manner independent of the apparatus. Then, a series of image processing functions such as a copy function can be achieved by comprising the image processing service with the apparatus image input/output function.

In this way, reducing functions to be packaged in the image processing apparatus simplifies configuration, thus making it possible to ensure price reduction. The structure of the image processing apparatus is simplified, whereby the number of failures that occur can be reduced, and management can be facilitated. Further, service selection enables arbitrary customization at a functional level.

Image processing services may be provided by a

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dedicated service over a network or may be provided by  
an image processing device. The image processing  
service can be utilized by a provider (image processing  
apparatus) itself or can be utilized by another image  
5 processing apparatus via a network.

When the image processing apparatus is thus  
connected via a network, even if a dedicated server for  
service provision does not exist, the image processing  
apparatuses each owning services are connected to each  
10 other, whereby a system can be achieved.

Further, in order to achieve an image processing  
function, a plurality of image processing services can  
be utilized by combining them with the image  
input/output function owned by the image processing  
15 apparatus. At this time, a plurality of image  
processing services utilized at the same time may be  
provided by their different servers or image processing  
apparatuses.

In this way, services are finely divided, whereby  
20 more rich content services can be provided. In  
addition, more service options are available. A unique  
function can be achieved by combining services with  
each other. Even services provided by the different  
servers can be combined with each other similarly.

25 In addition, the image processing apparatus has an  
image information compression/decompression function  
and an encryption function in order to make

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communication with an image processing service.  
Further, before starting communication with the image  
processing service, preliminary adjustment can be  
carried out between the image processing apparatus and  
5 service as to an image information encryption scheme.

In this manner, high quality service and security  
can be assured. In addition, exchange of contracts  
required for a charged service can be carried out.  
Image data is transmitted in a compressed manner,  
10 whereby the network load can be reduced.

Further, in order to utilize an image processing  
service, service utilization/registration processing is  
carried out for the image processing apparatus. A  
service which is not registered for utilization can be  
15 newly registered by operation of the image processing  
apparatus. A less frequent service can be temporarily  
used without making registration for utilization.

In this manner, new services can be additionally  
utilized by simple operation at the apparatus. A  
20 variety of needs can be satisfied by enabling temporary  
utilization which is not permanently utilized as an  
optional function.

In addition, for a service registered for  
utilization, information concerning user operation  
25 required for service utilization is acquired in  
advance, whereby the information can be stored in the  
image processing apparatus.



In this way, processing functions on the UI screen or the like for providing a variety of settings, which is required before executing actual image processing, are stored in advance in the image processing  
 5 apparatus, whereby the network load can be reduced and the processing time can be reduced.

Further, there exists a server that manages the image processing service utilization/registration state of each image processing apparatus or the result of  
 10 image processing service utilization. This server integrally substitutes a charge request or collection process for service utilization.

In this manner, services can be provided and utilized without worrying about charge payment  
 15 processing. In addition, a server including a small-scale server free of a charge collection mechanism can offer many services. A community of service provision, which is similar to the existing freeware or shareware, can be constructed.

20 Image processing services are supplied together with version information. The image processing apparatus checks the version registered for every service utilization, thereby making it possible to receive service of the registered version even if a  
 25 service itself is updated. Conversely, the latest service can be received irrespective of version information by registering the image processing service

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of the latest version to allow it to be always  
utilized.

5 In this manner, the update state of the service  
function can be checked. The latest service can be  
utilized without worrying about whether or not the  
service is updated. Providing a use restriction  
function enables price settings which are different  
from each other for every version.

10 Further, when the image processing apparatus  
utilizes an image processing service, first,  
information concerning the service utilization method  
is exchanged. Then, services are utilized based on the  
specified utilization method. In this manner, even if  
a change occurs with the utilization method due to  
15 service update, the service can be utilized in the same  
way as conventionally. Even if a drastic change is  
required for a service utilization method or the like,  
an automatic update function can be carried out.

20 In addition, link information on advertisement  
information is embedded in the received image  
information, and thus, the latest advertisement  
information is output to be displayed at a time when  
the information is displayed or output on a screen.  
Therefore, even if there is a time difference between  
25 image processing service utilization and image  
browsing, the latest advertisement information can be  
provided.

Further, contents such as a decorative frame, a rule, and a character logo are filled in the received image information so that a service similar to the existing value added paper can be provided.

5           A maintenance service for finding a problem with the image input side of the image processing apparatus can be utilized from the received image information. In addition, a sample image can be transmitted at a predetermined timing in order to utilize this service.

10           Further, a maintenance service for determining the replacement time of consumables or the like and maintaining the quality of the apparatus can be utilized from the service utilization history of the image processing apparatus. Furthermore, a service for  
15           analyzing a highly frequent service from the service utilization history and recommending a new service can be introduced.